## WHAT IS CLAIMED IS:

1 2 3

4

5

6

7

8

9 10

11

12

13

14

15

16

17

18

19

20

21 22

23

24

25

26 27

28

29

30

31

32

- 1. A crude oil desulfurization process comprising the following steps:
  - (a) hydrodesulfurizing a crude oil feed in a crude desulfurization unit to obtain a desulfurized crude oil:
  - (b) separating the desulfurized crude oil of step (a) into a light gas oil fraction, a vacuum gas oil fraction and a residual fraction;
  - (c) hydrocracking the vacuum gas oil fraction of step (b) into at least one fuel product having a low sulfur content; and
  - (d) hydrotreating the light gas oil fraction of step (b).
- The process according to Claim 1 wherein the step (c) of hydrocracking the vacuum gas oil fraction further comprises:
  - (a) passing the vacuum gas oil in combination with hydrogen to a first hydrocracking reaction zone to create an effluent comprising at least one fuel product having a low sulfur content;
  - (b) passing at least a portion of the effluent of step (a) to a second hydrocracking reaction zone; and
  - (c) recycling at least a portion of the second hydrocracking reaction zone effluent to the second hydrocracking reaction zone.
  - The process according to Claim 2 wherein the second hydrocracking reaction zone comprises a multiplicity of layered catalyst beds, including at least one hydrotreating catalyst layer which is maintained at reaction conditions preselected for high hydrotreating activity.
- 4. The process according to Claim 3 wherein the second hydrocracking reaction zone further comprises at least one hydrocracking catalyst layer which is maintained at hydrocracking reaction conditions, such that the entire effluent from the catalyst layer maintained at hydrocracking reaction conditions passes to the catalyst layer maintained at hydrotreating reaction conditions.

29

30

31 32

1 5.

2

3

4		is re	cycled to the second hydrocracking reaction zone.
5			
6	6.	The	process according to Claim 3 wherein the step (1) (d) of
7		hydi	rotreating the light gas oil fraction further comprises passing the light
8		gas	oil fraction to the hydrotreating catalyst layer.
9			
10	7.	The process according to Claim 1, wherein step (1) (c) further comprises	
11		isola	ating at least a diesel having a low sulfur content, a kerosene having
12		a lov	w sulfur content, and a naphtha having a low sulfur content.
13			
14	8.	The	process according to Claim 2 further comprising:
15		(a)	hydrocracking the vacuum gas oil to form a first hydrocracking
16			zone effluent;
17		(b)	passing the first hydrocracking zone effluent to a hot hydrogen
18			stripper and isolating a hydrogen-rich gaseous stream and an
19			effluent having a low sulfur content; and
20		(c)	passing the hydrogen-rich gaseous stream of step (b) to the crude
21			desulfurization unit for hydrodesulfurizing the crude oil feed.
22			
23	9.	The	process according to Claim 3 further comprising:
24		(a)	hydrocracking the vacuum gas oil to form a hydrocracking zone
25			effluent;
26		(b)	passing the hydrocracking zone effluent of step (a) to a hot
27			hydrogen stripper and isolating a hydrogen-rich gaseous stream
28			and an effluent having a low sulfur content; and

The process according to Claim 4, which further comprises fractionating

at least a portion of the effluent from the second hydrocracking reaction

zone and isolating at least one fuel product and a recycle stream which

10. The process according to Claim 9, which further comprises:

(c) passing the hydrogen-rich gaseous stream of step (b) to the crude

desulfurization unit for hydrodesulfurizing the crude oil feed.

1		(a)	passing the low sulfur effluent of step 9(b) in combination with
2			hydrogen to a second hydrocracking zone to produce a
3			hydrocracked liquid product; and
4		(b)	fractionating the hydrocracked liquid product of step (a) to form at
5			least one fuel product having a low sulfur content.
6			
7	11.	The	process according to Claim 10, further comprising passing the low
8		sulfu	ur effluent of step 9 (b) to the hydrotreating catalyst layer of Claim 6.
9			
10	12.	The	process according to Claim 1 wherein step (1) (b) of separating the
11		desi	ulfurized crude oil further comprises:
12		(a)	separating the desulfurized crude oil in an atmospheric distillation
13			column and isolating at least a light gas oil and an atmospheric
14			residuum therefrom;
15		(b)	separating the atmospheric residuum of step (a) in a vacuum
16			distillation column and isolating at least a vacuum residuum stream
17			and a vacuum gas oil stream.
18			
19	13.	The	process according to Claim 8 wherein the first hydrocracking zone
20		efflu	ent of step (8) (a) is passed to a second hydrocracking reaction
21		zone	e without substantially cooling the first hydrocracking zone effluent.
22			
23	14.	A cr	ude oil desulfurization process comprising:
24		(a)	hydrodesulfurizing a crude oil feed in a crude desulfurization unit to
25			obtain a desulfurized crude oil;
26		(b)	separating the desulfurized crude oil of step (a) and isolating a light
27			gas oil fraction, a vacuum gas oil fraction and a residual fraction;
28		(c)	passing the vacuum gas oil fraction of step (b) in combination with
29			hydrogen to a first hydrocracking reaction zone, where it is
30			hydrocracked to produce a first hydrocracking zone effluent;
31		(d)	passing at least a portion of the first hydrocracking zone effluent of
32			step (c) to a second hydrocracking reaction zone comprising a
33			multiplicity of catalyst beds, including at least one hydrotreating

1		catalyst layer which contains catalyst preselected for high
2		hydrotreating activity;
3	(e)	passing the light gas oil fraction of step (b) to the hydrotreating
4		catalyst layer of step (d) for hydrotreating the light gas oil fraction;
5		and
6	(f)	recycling at least a portion of the combined effluent of steps (d) and
7		(e) to the second hydrocracking reaction zone.